Table 2-4. Environmental coordination and review requirements.

Note: addresses for agencies and offices listed below are provided in Appendix D.
PART 1. THE FOLLOWING ENVIRONMENTAL COORDINATION REQUIREMENTS ARE APPLICABLE TO NEARLY ALL PROJECT SITES.

RESOURCE/OBJECTIVE	WHO TO CONTACT	INFORMATION TO BE OBTAINED AND PROVIDED IN THE EID
Cultural Resources Federal agencies are required to take into account possible effects of their actions on properties which are in, or which are eligible for inclusion to the National Register of Historic Places (NRHP)	State Historic Preservation Officer (SHPO) Based on input from SHPO, contact may need to be made with the Advisory Council on Historic Preservation (ACHP)	The Applicant must identify and provide information on properties (such as historic buildings; archeological sites) which are listed on the NRHP, or which are eligible for listing, if those properties may be affected. If SHPO data for the area are insufficient to identify properties or indicate there is the potential for unidentified properties, a cultural resource survey may be required following guidelines published in Standards nad Guidelines for Archeologic and Historic Significance. EID project descriptions need to be clear in identification of all portions of a project site which will be disturbed. The EID should describe the efforts undertaken to identify historic properties on the site, the sites identified, and the expected impacts. This documentation always includes written statements which demonstrate the views of the SHPO; and may include additional materials if there are potential impacts to listed or eligible sites. Include all correspondence with SHPO.
Threatened and Endangered Species Federal agencies are prohibited from taking or for jeopardizing Federally listed threatened or endangered species or adversely modifying habitats critical to their survival.	U.S. Fish and Wildlife Service (USFWS) for terrestrial and fresh water species. National Marine Fisheries Service (NMFS) for marine species. State fish and wildlife agencies.	In the EID, the Applicant should identify all listed, proposed or candidate species or designated or proposed critical habitats that may be present in the vicinity of the proposed action. Contact the appropriate USFWS or NMFS office for an identification of all listed or proposed threatened or endangered species or critical habitats present in the vicinity of the project site. This will initiate informal consultation. If it is determined that threatened or endangered species or habitat are present and may be impacted, a Biological Assessment will need to be prepared to examine any possible impacts of a proposed action upon affected species or critical habitats. A Biological Assessment is a specialized document; guidance for its preparation should be obtained through correspondence between the Applicant and the USFWS/NMFS. State lists of species should also be obtained. Procedures for compliance with State regulations vary by State.

RESOURCE/OBJECTIVE	WHO TO CONTACT	INFORMATION TO BE OBTAINED AND PROVIDED IN THE EID
Construction in a Waterway		
All projects involving any activities in waters of the U.S. must acquire a Section 10 permit (for activities in navigable waters) or a Section 404 permit (for activities in all other waters).	U.S. Army Corps of Engineers (COE).	The Applicant should contact the local COE office to determine whether a Section 10 or Section 4()4 permit is needed for their project and whether their project is covered by a nationwide or general permit, or an individual permit is needed. It is often the case that small projects require no permit, or are covered by an existing nationwide or other permit. In the EID, the Applicant should include a copy of all correspondence with the COE, including the determination of whether a permit is needed, the type, and an identification of any jurisdictional waters or wetlands which may be impacted by the project. Specific procedures apply when an individual permit is required; coordination on such permits should begin with the COE.
Wetlands		
Federal agencies are to avoid, to the extent possible, the adverse impacts associated with the destruction, degradation, or loss of wetlands; and to avoid support of new construction in wetlands if a practicable alternative exists.	USFWS. State fish and wildlife agencies. COE (see also Section 404 and Section 10 permit discussion). Natural Resources Conservation Service (NRCS - formerly the Soil Conservation Service - SCS; for projects involving actively fanned lands.)	The Applicant must determine whether there are any wedands/water resources within the vicinity of the project that could be impacted by the construction or operation of the proposed project. 'Me Corps may survey the site, or require a survey of the site, for purposes of wetlands characterizafion. NRCS will provide information on wetlands on agricultural lands (e.g., land application sites). If the COE determines that wetlands on the site are subject to Section 404 of the Clean Water Act, then coverage of and compliance with a nationwide permit is required, or an individual Section 404 permit must be obtained, see above. If the project will impound, divert or otherwise modify wetlands or water resources, the Applicant will also need to consult with the USFWS and appropriate state wildlife agencies regarding any potential impacts to fish and wildlife and the development of alternatives and mitigation measures to reduce any adverse impacts. In the EID, the Applicant will need to demonstrate that there are no wetlands or water resources in the vicinity of the project site; or obtain a delineation of those resources which are present, assess impacts on those wetlands, and document compliance with the Section 404 regulations. It is important to include all correspondence with tt.e COE and, if appropriate, coffespondance with the NRCS and/or U.S. Fish and Wildlife Service.

RESOURCE/OBJECTIVE	WHO TO CONTACT	INFORMATION TO BE OBTAINED AND PROVIDED IN THE EID
Floodplains Federal agencies must evaluate the potential effects of a project on floodplains to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain.	Federal Emergency Management Agency (FEMA). State floodplain management offices.	The Applicant needs to identify any floodplains in the vicinity of the project. FEMA maintains maps delineating 100-year and 500-year floodplain areas; these are often available through city and county planning offices or may be obtained directly from FEMA. The EID should demonstrate that there are no floodplains in the vicinity of the site, or if there are, provide maps showing the location of the floodplains. If there are floodplains which could be impacted by the project, then the EID should include a floodplains assessment, the format and content of which will need to be worked out in consultation with EPA. Note that interactions may exist between floodplain management activities and Section 404/Section 10 permits (described above under 'Construction in a Waterway').
Prime Agricultural(Farm) Lands Federal laws require the protection of important farmlands and require that, to the extent possible, these lands not be irreversibly converted to other uses.	National Resources Conservation Service (NRCS).	The Applicant needs to identify whether any significant agricultural lands may be affected by the proposed action. The applicant can identify whether there are any prime agricultural lands in the vicinity of the site based on information from state and local planning agencies and other sources, or this can be done for the Applicant by the NRCS. The NRCS will notify the applicant in writing whether or not the land is considered prime farmland; if it is, NRCS will provide the applicant with a map delineating the location of the lands and classify the lands according to their significance. The EID should document whether or not there are prime agricultural lands in the vicinity of the project site; and it should provide copies of all correspondence with the NRCS, including a map delineating prime agricultural lands. If an assessment of impacts on prime farmlands is needed, the format and content of that assessment should be completed in consultation with the NRCS.
Air Quality - SIP Conformity All Federal actions must conform to any State Air Quality Implementation Plan (SIP)	State and local air quality offices.	The Applicant should determine if the proposed project would require a permit related to air emissions, or otherwise have a potentially significant adverse impact on air quality and if it does, consult with State and local agencies as to the conformity of the action with the SIP. In the EID, the applicant should document that the project would not have a significant adverse air quality impact; or if it may have an adverse effect, then there should be an assessment of potential air quality impacts, and identification of any alternatives or mitigation measures to reduce those impacts.
Permits/approvals State air and water quality permits-, RCRA permits, etc,	Federal, State and local government agencies	For all permits or other approvals required for the proposed project, as identified in the project description, the Applicant should provide information on the status of obtaining the permit/approval, the name and address of the person at the agency processing the permit/approval, and if the permit has been issued the permit number. Examples of such permits could include a stormwater discharge permit. a mining permit, a zoning permit, a water rights permit.

PART II. THE FOLLOWING ENVIRONMENTAL COORDINATION REQUIREMENTS WILL NOT BE APPLICABLE TO ALL PROJECT SITES.

RESOURCE/OBJECTIVE	WHO TO CONTACT	INFORMATION TO BE OBTAINED AND PROVIDED IN THE EID
Coastal Zone Areas All Federal activities in coastal areas must be consistent with approved State Coastal Zone Management Programs to the maximum extent possible.	State office responsible for Coastal Zone management Programs.	If the Applicant's project (or its effects) could occur within a coastal area, the applicant needs to identify whether or not the proposed action is within a 'coastal zone management area and if so whether the proposed action is the type of activity listed for review in the State Coastal Management Plan. If it is, the applicant will need to coordinate with the state to assess the impact of the proposed action on the coastal area and identify alternatives and mitigation measures that would reduce any adverse impacts. In the EID, the applicant should include a statement, and supporting documentation as appropriate, that the project is not in nor would it effect a coastal zone management area; Or if the project could affect a coastal zone management area: (1) copies of all correspondence with the state coastal zone management office, including a "statement of consistence' with the State CZM plan, (2) an assessment of the impact of the project on the Coastal Zone Management Program and the identification of any alternatives or mitigation measures to reduce those impacts.
Coastal Barriers Coastal barriers and adjacent wetlands, marshes, estuaries, inlets and nearshore waters, part of the Coastal Barriers Resource System, are protected under Federal law and Federal actions are generally prohibited within these areas	National Park Service (NPS).	[f the applicant's project could affect coastal barriers, the applicant should contact the USFWS to see whether the proposed activity' is allowed and whether the activity is consistent with the Coastal Barriers Resources Act. In the EID, the applicant should include a statement that the proposed project would not affect coastal barriers; or if the project could affect coastal barriers, copies of all correspondence with the USFWS.
National Natural Landmarks (NNLS) Federal agencies are required to consider a proposed action's impacts on the existence and location of natural landmarks in order to avoid undesirable impacts on such landmarks.	U.S Fish and Wildlife Service.	The Applicant must identify whether there are any NNLs in the project area and any potential impacts to such sites. The applicant may contact the National Park Service for identification of these sites and consult with them on possible alternatives and mitigation measures to reduce any adverse impacts. The EID should include a statement as to whether or not there are any NNLs in the project area and if there are it should: (1) identify the sites and their location; and (2)identify any impacts to those sites and alternatives and mitigation measures to reduce or avoid any adverse impacts.

RESOURCE/OBJECTIVE	WHO TO CONTACT	INFORMATION TO BE OBTAINED AND PROVIDED IN THE EID
Wild and Scenic Rivers Federal agencies must consider any direct and adverse impact on the values for which a river in the National Wild and Scenic Rivers System or a study river on the National Rivers Inventory was established.	National Park Service (NPS).	Same as for National Natural Landmarks, described above.
Other	Federal, state and local government offices	The Applicant should contact EPA for any additional coordination requirements, especially if the proposed project could effect other unique envirorunental features such as wilderness areas, national or historic trails, or unique geologic features.

Table 3-1. Data table with project information (Oklahoma coal projects)

TABLE 1-1. PROJECT INFORMATION FARRELL-COOPER MINING Co., LE FLORE COUNTY OKLA.

NAME	**WISTER WEST**	**SHADY POINT***	**REED #2**	**SHADY POINT #2**
EPA NPDES application	OK0041351	OK0042382	OK0042595	OK0042340
ODOM surface mine #	#94/99-4248	#94/99-4247	#94/99-4237	#L.E.-1295
Primary source of info	BMC, 1994	BBA, 1994	Hudson-Blake, 1992	EMERA, 1994
Location	Sec. 11, 12, 13, 14 of T6N-R23E	Sec. 2, T6N-R23E; Sec. 35, T7N-R23E	Sec. 17,18, 17N-R24E	Sec. 36, T8N-R24E; Sec. 31, T8N-R25E
Type of facility	surface coal mine	surface coal mine	surface coal mine	ash disposal in abandoned mine
Status	mining to start	active	under reclamation	active
Bond amount	$184,172	$768,350	$420,000	$130,000
Acres in permit area	517.0	449.4	122.2	160.0
Existing use (acres)				
Undeveloped wooded	376.2	328.7	3.6	115.5
Pasture land	121.5	90.5	0	41.0 (old mine pits, spoils)
Forest land	0	23.5	115.9	0
Ponds	0 (2 flood impoundments)	3.0(1 pond)	0.5 (I pond)	3.5 (abandoned mine pits)
Road	19.3	0	0	0
Residential	0	3.8	0	0
Grazing land	0	0	2.2	0
Acres to be disturbed	368.2	341.4	92.4	80.0 (incl. old minepits)
Reclamation (acres)				
Pasture land	354.9	143.9	0	67.2
Forest land	0	148.3	80.3	0
Ponds	6.7 (I pond)	20.6 (7 ponds)	8.2 (5 ponds)	2.5 (2 ponds)
Roads	6.6	9.6	3.9	10.3
Riparian	0	19.0	0	0
Name of coal seam	Secor Seam of Boggy Formation	same	same	coal & limestone ash (70% fly ash, 30% bottom ash) from AES Shady Point Power Plant
Thickness of coal seam	2.9 ft. (2 seams separated by 20 ft.	4 ft (2 to 3 seams, 3 feet apart)	ND	ND
% sulphur	3%	1.7-6.7%	ND	NA
% ash	15%	14.6-30%	ND	NA
Btu/lb	ND	10 to 13 thousand	ND	NA
Tons total	725,000	747,367	ND	I million cu. yds, ash disposal
Tons/yr	240,000	124,561	ND	0-145 cu. yd./year
Overburden, ft	10 to 70 feet	20 to 80 feet	about 50 feet	NA
Comments	Coal transported to crusher at Wister East mine	Coal transported to crusher at Wister East mine, haul roads to be permanent; Caston Ck to be relocated	original plan for 1 million cy.	Company reports that total ash disposal will be less than

ND:no data on this subject found in submittals provided to EPA.
NA: not applicable to this project *formerly Wildhorse #1 Mine

Table 3-2. Data table, technical information (Oklahoma coal mine)

TABLE 2-5. DATA ON METALS IN WISTER EAST RUNOFF(all values in mg/l)

	EPA Aquatic Criteria Fresh Water		SW-1			SW-3			SW-4		SW-5
	Acute	**Chronic**	**03/11/94**	**06/21/93***	**04/15/93**	**03/11/94**	**06/21/93***	**04/15/93**	**03/11/94**	**04/15/93**	**03/11/94**
pH			6.93	7.18	6.80	6.76	7.37	6.70	4.35	6.92	7.01
Suspended Solids			14	70	68	17	9	1	20	9	0
Dissolved Solids			80	71	80	65	69	116	67	146	44
Arsenic	0.360	0.190	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Barium			0.15	<0.1	<0.1	0.09	<0.1	<0.1	0.14	<0.1	0.09
Cadmium[12]	0.0039	0.0011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chloride			4.0	8	7	5.5	8	8	4.5	19	3
Chromium, Total[12]	0.016	0.011	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper[12]	0.018	0.012	0.159**	<0.02	<0.02	0.159**	<0.02	<0.02	0.156**	<0.02	0.161**
Cyanide	0.022	0.0052	0.001	0.001	0.014**	0.001	0.009**	0.003	0.004	0.002	0.002
Iron, Total		1.0	1.991**	1.86**	2.33**	2.183**	1.35**	1.94**	0.170	0.4	1.206**
Lead[2]	0.082	0.032	0.035	<0.001	<0.1	0.064**	<0.001	<0.1	0.035**	<0.1	0.056**
Manganese, Total			0.015	0.50	0.32	0.022	0.07	0.10	0.010	0.02	0.031
Mercury[1]	0.0024	0.000012	<0.0009	<0.002	<0.002	<0.0009	<0.002	<0.002	<	<0.002	<0.0009
Nickel[2]	1.4	0.160	<0.04	1.69**	<0.04	<0.04	1.39	<0.04	<O.04	<0.04	<0.04
Selenium	0.02	0.005	0.0012	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
silver[12]	0.0041+		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulfates			0.172	13.87	24.18	0.442	14.44	22.17	33.8	43.14	0.000
Zinc	0.120+	0.110+	0.023	0.005	0.040	0.023	0.005	0.009	0.013	<0.005	0.020

1 =For at least some samples, detection limb exceed critera.
2 =Criteria is hardness dependent; value shown here assumes 100 mg/l.
**= Criteria exceeded

Table 3-3
Hydrogeologic Evaluation of Sites for Carrizo Recharge

Site	On/Off High Sandstone Trend[1]	Thickness of Carrizo lnterval (ft)	Net Sand In Carrizo (ft)	Estimated 1990 Unsaturated Thickness in Carrizo (ft)	Hydraulic Conductivity of Carrizo gpd/ft[2]	Transmissivity of Carrizo gpd/ft (1970)	Change in Carrizo Water Level Since 1980 (ft/yr)	Water Quality Information
Northwest	On	405-690[2]	300-400[4]	82-170[6]	410-440[2]	120,000[7]	-1.6[8]	Median pH 6.6[9] (4 analyses) Median Fe 2.26 mg/l (2 analyses) Median TDS 243 mg/l (4 analyses)
N. Central Atascosa Co.	Off	200-4003[3]	70-3003[3]	150-2003[3]	1303[3] (gross sand)	6,000-26,0003[3]	-1.43[3]	Median pH 6.0[3] (30 analyses) Median Fe 3.2 mg/l (5 analyses) Median TDS 217 mg/1 (34 analyses)
S. Bexar Co.	On	660-863[2]	400-5OO[5]	150-250[6]	300[5]	160,000[5]	-0.9[8]	Median pH 6.3[10] (7 analyses) Single analysis: 24 mg/l Fe Median TDS 122 mg/l (7 analyses)
North Wilson County	On	350-585[2]	200-250[4]	110-230[6]	340-440[2]	60,000-100,000[7]	-0.3[8]	Median pH 6.7[9] (7 analyses) No iron data Median TDS 144 mg/l (7 analyses)

[1]Hamlin (1988, Figure 21).
[2]Klent, et al (1976, computer model input files [PHYS/70MEW data set]).
[3]LWA. 1990a. Note that transmissivity value is for 1990 conditions.
[4]K]emt. et al. (1976, Figure 9).
[5]LWA. 1990b.
[6]Water level declines in nearby TWDB Carrizo monitoring wells were combined with data from the Klemt, et al. (1976) computer model to produce these estimates.
[7]K]emt. et al. (1976, Figure 16).
[8]Data from nearby TWDB Carrizo water level monitoring wells.
[9]Data from Klemt, et al. (1976, volume 2).
[10]Data from TWDB water-quality database; additional data may be available for wells nearby.

Table 3-4. Data table, alternatives (Arkansas pipeline route)

TABLE 5-1. ENVIRONMENTAL IMPACTS OF ALTERNATIVE PIPELINE ROUTES, PRELIMINARY ANALYSIS.

ROUTE:	A: Weddington Gap to SWEPCO	B: Weddinqton Gap to Chambers Hollow to SWEPCO	C: Illinois River to Pedro to SWEPCO	D: Illinois **River** to Robinson to SWEPCO
LENGTH OF ROUTE a/	18.8 miles	20.9 miles	20.3 miles	20.7 miles
GEOLOGY/SOILS				
Bedrock at < 60" b/	7.8 miles	8.8 miles	5.4 miles	4.7 miles
WATER				
Miles of dewatering a/	3.5 miles	6.0 miles	9.5 miles	12.0 miles
Miles of flood hazard a/	4.5 miles	7.0 miles	12.0 miles	12.0 miles
Other	Passes close to Lake Weddington, a major recreation lake	Passes close to Lake Weddinqton	Construction In Illinois River and mountain streams	Construction in Illinois River floodplain
BIOTA				
Riparian habitat a/	22 acres	36 acres	57 acres	73 acres
Forest habitat a/	48 acres	36 acres	36 acres	9 acres
Cave habitat c/	common	common	common	common
Other c/d/e/	2 virgin prairie sites within 1000 ft of corridor	passes through rare stand of hardwoods	passes trout farms and new wild turkey area	trout farm and wild turkey area
ARCHEOLOGICAL SITES f/	possible encounters	possible encounters	possible encounters	possible encounters
OWNERSHIP/LAND USE				
U.S. Forest Service a/	5.5 miles, 33 acres	5.5 miles, 33 acres	2.0 miles, 12 acres	none
Private or other a/	13.3 miles, 81 acres	15.4 miles, 93 acres	18.3 miles, 111 acres	20.7 miles, 126 ac.
DOLLAR COSTS				
Capital cost of pipeline a/	$10.8 million	$11.8 million	$11.5 million	$11.7 million
Average annual O&M cost h/	0.20 million	0.20 million	0.16 million	0.16 million
Equivalent present worth	12.8 million	13.8 milion	13.0 million	13.3 million
Equivalent annual cost	1.25 million	1.34 million	1.27 million	1.29 million

a. estimated from U.S. Geological S(irvey topographic maps, scale 1:24,000; acreages assume 50 foot corridor.
b. SCS, 1975.
c. Shepherd, 1982.
d. Goddard, 1982.
e. Rhodes, 1982.
f. Hilllard, 1982.
g. Williams, 1982.
h. Clark, 1982.

Table 3-6. Narrative table, environmental data (Texas stormwater)

SUMMARY OF PHASE I STORMWATER QUALITY SCREENING RESULTS, EL PASO, TEXAS

Relevance	Montoya Drain	Mesa Intercept System
GENERAL WATER CONDITIONS Site conditions describe the sample site setting. Flow indicates the presence of ground water or other discharges. Unusual (e.g. reddish) color can be caused by chemical industry discharges. Turbidity indicates construction, or normal desert runoff. Surface scum can be from many sources, but especially urban runoff. Odor is often from wastewater, chemical industry, or organic decomposition in stagnant areas. oil sheen is usually from urban runoff, refining or chemical industries. Impacts are mostly aesthetic, or to aquatic life.	DRY WEATHER. Site conditions indicate that weeds/reeds increase downstream. Flow was significant at sit sites except the head of the drain (trickle) and the Montoya Interceptor (stagnant). Color was brownish-green. Turbidity was low to moderate. Little or no surface scum, odor, or oil sheen occured except algae and sewage smell at sites 1 and 2 (below the Country Club). DRY WEATHER. Sites contained murky water and flows were one to five mph or greater, except the Montoya Interceptor was stagnant, and no changes in flow were observed at the Montoya Drive site. Color was mostly tight straw. Turbidity increased from slight upstream to moderate downstream. There was little to no surface scum, odor, or oil sheen.	DRY WEATHER. Site weeds/reeds increase downstream; water was murky at most sites. Flow was generally stagnant. Color was in shades of straw. Turbidity was tight to moderate. Little or no surface scum, odor, or oil sheen, except for scum in the vicinity of sample points 7 and 8 (above and below Feather Lake) and 13 (Playa Drain). A faint sulfide smell was reported below Feather Lake and in the Playa Drain. WET WEATHER. tended to change from murky to muddy. Flows were highly variable. Color varied from brownish upstream to tight straw downstream. Turbidity was high upstream and decreased downstream. Surface scum as plant debris and algae was notable upstream; trash, tires and construction debris were at sites 9 and 10 (below Feather Lake to Franklin Drain). Little or no odor or oil sheen. Tadpoles and fishy smelts were noted near Feather Lake.
TOTAL CHLORINE Indicates discharges from domestic or industrial sources, and may result in impacts to aquatic Life.	W3 (below Nemexes) and the outfall to the Rio Grande were sampled during wet weather. Values ranged from 0.04 to 0.07 mg/L. The presence of higher chlorine levels in the storm drains than in the control (agricultural) drains (0.02 to 0.04 during dry weather) indicates an urban source of chlorine. Possible sources are industry discharges and outdoor use of chlorinated municipal water. See Tab 4.	5 sites were sampled: 2, 7, 15 (wet weather), and 21 and the control sites (dry weather). Values ranged from 0.02 to 0.3; control values were 0.02. See discussion for Montoya Drain; see graph and spreadsheet at Tab 6.

Table 3-7. Narrative table, alternatives (new Mexico sewer lines)

TABLE 5 SUMMARY OF EVALUATED INTERCEPTOR ALTERNATIVES FOR ZUNI VILLAGE

Altenative	Capital Cost*	Annual O&M Costs	Comments
7	$1,197,000	Includes 2 major lift stations	Includes two major lift stations "A" and "B".Replaces lift station "C" with gravity interceptor. High capital costs. High O&M costs.
8	988,000	Includes I major lift station and I small lift station	Includes one major lift station "C" with a gravity interceptor and replaces lift station "B"'with a subdivision type lift station. High O&M cost.
9	870,000	Includes no lift stations	Eliminates all existing lift stations with a gravity line to the existing lagoon facility. However, it requires construction through land considered sacred to the Zuni people, which is unacceptable. High impact on cultural beliefs of Zuni people.
10	870,000	Includes one new lift station near lift station “D”	Eliminates three of the largest lift stations with **a** gravity line to the existing lagoons. Least effect on cultural and religious sacred grounds located along the river.

*Includes cosls ordy for conveyance system downstream from **the** community.

(source: MCA, 1992)

Table 3-10. Landscape units table (Oklahoma sewer lines)

TABLE 2-1. GENERALIZED ENVIRONMENTAL CHARACTERISTICS OF NATURAL REGIONS IN THE NORMAN AREA, OKLAHOMA.
Refer to Figure 2-1 for location of areas.

ENVIRONMENTAL CHARACTERISTIC	BOTTOMLANDS	PRAIRIE UPLANDS	FORESTED UPLANDS
Location & Subunits	Along or near major streams; includes two subunits; stream flood plains; adjacent low terraces.	Western and highest portion of planning; includes two subunits; high terraces near streams; upland plain elsewhere (on shale rock).	Eastern portion of planning area; includes mixture of two subunits on sandstone rocks versus shale rocks respectively. Alluvial valleys also occur and resemble bottomland unit.
Terrain	Generally level land; low terraces lie at least a few feet above the flood plains. Slopes seldom exceed 2 percent.	Gently rolling plain; terraces are slightly dissected with slopes of less than 5 percent; uplands a bit more dissected with slopes generally less than 10 percent. Local relief varies from 20 to 150 feet.	Rolling plain and hilly terrain. Slopes are commonly from 5-10 percent, but hills tend to be steeper sided where cut by streams occupying broad, relatively flat floored alluvial valleys. Local relief varies from 50-200 feet.
Drainage; hydrology	Cut crosswise by short, mostly intermittent streams heading in the adjacent uplands. Surface water is generally available in quantity, but seldom used due to need for diversion, storage and treatment facilities. Groundwater generally available at shallow depths in moderate quantity. Unit is subject to flooding.	Well-developed network of shallow stream valleys with dendritic drainage. Small ponds capture sheet and stream runoff in upper portion of many valleys. Many swales and low spots exist which can be flooded to a shallow depth. Groundwater is often not available or of poor quality, except when deep (500 feet +) wells are drilled.	Well-developed network of valleys with dendritic drainage; gullies occur locally. Ground water is generally available at shallow depths in moderate quantities, and locally discharged at springs.
Geology	Unconsolidated alluvial deposits of Quaternary age, 0-70 feet thick; interfingering lenses of sand, silt, clay, and gravel in floodplains.	Terrace deposits and Hennessey Group, Quaternary and Permian in age; terrace deposits 0-100 feet thick and similar to alluvium; Hennessey 0-100 ft. thick and is a massive reddish-brown shale with siltstone and fine sandstone layers.	Garber-Wellington formations of permian 800-1000 feet thick; reddish to orange-brown massive cross-bedded, fine-grained, loosely cemented, lenticular sandstone irregularly interbedded with silty or sandy shales.
Soils	Alluvial materials ranging from sand and clay on bottomlands to fine sand or silt loams on low terraces. Texture is highly variable, and soils tend to be deep.	Variable but generally fine on shales, ranging from silt loams to claypan, with slow drainage and high susceptibility to erosion. Terrace soils are coarser silty to sandy loams, with better drainage and less susceptibility to erosion.	Generally lighter, shallower and sandier than other soils in area, with good internal drainage except in areas of shale outcrop. Erosion common on steeper slopes.

Table 3-1. Impacts analyzed by landscape units (New Mexico grazing project)

TABLE 3-5. IMPACTS ON WIND EROSION AND SEDIMENT YIELD, BY NATURAL UNIT
tay=tons per acre per year. Ty=tons per year.
Afsmy=scre-feet per square mile per year. Afy=acre-feet per year.

	Mountain Foothills	Canyonlands	Mesa	Rimlands	Alluvial Fans	Bolson	Total
1. Acres in Unit, Co-use area	15,000	38,OOO	110,OOO	64,OOO	179,000	109,OOO	515,000
2. Acres affected by proposed action	15,000	38,000	110,000	2,000	61,000	45,000	271,OOO
3. Present wind erosion rate, tay	0	0	20	0	23	140	-
4. Total wind erosion at present, ty (1 x 3)	0	0	2,200,000	0	4,177,000	15,260,000	21,637,000
5. Predicted wind erosion rate on affected areas, tay	0	0	23	0	28	160	
6. Increase in wind erosion, ty ((5-3) x 2)	0	0	330,000	0	305,000	900,000	1,535,OOO
7. Total wind erosion, future, ty (4 + 6)	0	0	2,530,OOO	0	4,482,000	16,160,000	23,172,000
8. Net change, percent (4/7)	0	0	13	0	7	6	7
9. Present sediment yield, afsmy	0.47	0.32	0.37	0.35 a/	0.45	0.29	-
10. Total sediment yield at present, afy (lx9 divided by (>40 acres)	11.0	19.0	63.6	35.0	125.9	49.4	303.9
11. Predicted sediment yield on affected acres, afsmy	0.53	0.38	0.42	0.41 b/	0.55	0.37	-
12. Increase in Cement yield, afy ((11-9)x2 divided by 640 acres)	1.4	3.6	8.6	0.2	9.5	5.6	28.9
13. Total sediment yield, future, afy (10 + 12)	12.4	72.6	72.2	35.2	135.4	55.0	332.8
14. Net change, percent (10/13)	11	18	12	0	6	9	8

a/. Average of range of 0.3-0.4.
b/. Change assumed proportional to change in Canyonlands.

Source: Allen and Anderson (1980).